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ARNOLD ARBORETUM
HARVARD UNIVERSITY

BULLETIN
OF
POPULAR INFORMATION

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Conifers. Representatives of only fourteen genera of the twenty-nine genera into which conifers are now usually divided can be grown in the northeastern states. None of the five genera which are confined to the Southern Hemisphere can be grown here, and of the two genera Callitris and Libocedrus which have representatives north and south of the equator only the North American Libocedrus is growing in the Arboretum. Seven of the genera of eastern Asia consist of a single species, but unfortunately only three of these interesting trees, Pseudolarix, Sciadopitys and Cryptomeria, find places in northern collections. Of the other genera with hardy representatives only Taxodium is confined to North America, the others being widely distributed through the Northern Hemisphere. Important genera of the Northern Hemisphere with more than one species which cannot be grown in the Arboretum are the Chinese Keteleeria and Cunninghamia, Sequoia and Cupressus.

Pinus among the conifers contains the largest number of species and, with the exception of Juniperus, is the only northern genus which extends into the tropics. It is not surprising, therefore, that of the some seventy species of Pinus which botanists now generally recognize less than half are in the Arboretum collection where there are now growing twenty-seven species with numerous distinct geographical varieties. The collection contains all the species of the northeastern and middle United States, eastern Canada and the Rocky Mountains, but only four or five of the Pacific Coast species. The Pines of Mexico, which is one of the headquarters of the genus, are represented only by *Pinus ayacahuite.* Europe has contributed to the collection only the species of the northern, central and eastern parts of the continent, for the interesting species of the south and southeast are not hardy in the Eastern States, although they flourish on the Pacific Coast. Of the species of the Himalayas only a White Pine, *Pinus excelsa*, can be induced to grow here. The Pines of the Chinese Empire, with the exception of the tropical or semitropical *Pinus Massoniana*, are established in the Arboretum. They are *Pinus sinensis*, with three distinct geographical varieties, which when better known may prove distinct species, *P. Armandi* and *P. Bungeana*. All the Pines of Siberia, Manchuria, Korea, and of Japan proper, can be seen growing and in fairly good condition in the Arboretum.

Larix, although widely distributed through the northern and elevated parts of the Northern Hemisphere, contains only a few species. They are all growing in the Arboretum with the exception of the Himalayan *Larix Griffithii* which is not hardy, and the alpine species of western North America and western China, *Larix Lyallii* and *L. Potaninii*, which although hardy have not been able to adapt themselves to sea-level conditions. Hybrid Larches are known and are growing in the Arboretum.

Picea, which grows in most northern regions, does not range southward, although it occurs on the southern slopes of the Himalayas and on the high mountains which form the border between western China and Thibet. Although many of the Spruces lose their beauty early in this climate they can all be grown in eastern Massachusetts with the exception of the two Himalayan species, the Formosa *Picea morrisonicola* and the two species of Pacific North America, *Picea sitchensis* and *P. Breweriana*. The three European Spruces are in the collection one of these the so-called Norway Spruce (*Picea Abies*) has been more generally planted in the northeastern states than any other Spruce. It is hardy and grows rapidly for forty or fifty years, and then usually begins to fail in the top and soon becomes unsightly. The general planting of this tree in New England during the last sixty or seventy years must be considered a misfortune. The handsome Balkan Spruce (*Picea omorika*) which has now been growing in the Arboretum for thirty-eight years, is still in good condition and gives every promise of being a valuable tree in this climate. Unfortunately, however, it is attacked by the borer which does so much injury to the native White Pine. The Spruce of the Caucasus (*Picea orientalis*), which resembles in general appearance the native Red Spruce, has been growing in Massachusetts for more than fifty years; like the Balkan Spruce it too often loses its leader by the attacks of borers. The oldest specimen of the Siberian Spruce (*Picea obovata*) in the Arboretum collection was raised here from seed forty-three years ago. It has grown slowly but is in good health and retains all its branches. No less than seventeen Spruces discovered in China and Manchuria during the last twenty years are established in the Arboretum, and among them only *Picea Sargentiana* has not proved to be perfectly hardy in this climate. Most of these Spruces are large, handsome and valuable trees in their native forests and there seems to be no reason why some of them at least should not succeed here permanently. At least fifty years more, however, will be needed to settle this question. One of the Spruces of northern Japan, *Picea jezoensis*, and its southern form (var. *hondoensis*) have grown miserably in Massachusetts up to the present time and give little promise of ever being valuable in this climate. The rare Tiger-tail Spruce (*Picea polita*) grows rapidly and is a perfectly hardy tree, but often begins to lose its lower branches before it is thirty feet tall. The northern *Picea Glehnii*, introduced by the Arboretum from seeds obtained by Professor Sargent in Hokkaido in 1892, now promises to be a handsome tree in this climate. The handsomest of the Japanese Spruces, judged by the few trees cultivated in Massachusetts, is *Picea bicolor*, or as it is more commonly called, *P. Alcockiana.* This tree, which is rare in Japan, was discovered in 1862 during the first ascent of Fuji-san by Europeans. Seeds were collected at this time and sent to Europe and it is probable that the few large trees of this Spruce cultivated in the United States and Europe were raised from these seeds. The trees cultivated in Europe under this name are usually *Picea jezoensis* var. *hondoensis*, and the Arboretum knows only five of these trees in the United States, two in the Hunnewell Pinetum, one also planted by Mr. Hunnewell in the grounds of the Town Hall at Wellesley, and two on the Phillips Estate in North Beverly, Massachusetts. In the Arboretum there are only small unsatisfactory grafted plants, and for years the Arboretum has tried without success to obtain a supply of seeds from Japan, for, judging by our present knowledge of the behavior of Spruces in this climate, *Picea bicolor* promises to be the handsomest which can be grown in this part of the country.

Abies. Fir-trees, like the Spruces, are widely distributed with many species through northern and elevated regions of the Northern Hemisphere, growing rather further south than the Spruces, as one Fir-tree grows in Mexico, one in Spain, one in northern Africa and several in southeastern Europe and Asia Minor. Many of the Firs are large and handsome trees, but the genus has not contributed much to the beauty of our northern plantations. Many of the handsomest and most interesting species are not hardy here, and several of the others are not presentable for more than a few years. Judging from the results which have now been obtained with these trees there are only two Firs which can be depended on to retain their beauty here for more than fifty years. These are the western American White Fir (*Abies concolor*), especially the form which grows on the mountains of southern Colorado, and the Japanese *Abies homolepis* or *brachyphylla*, a splendid tree with dark green leaves white on one surface and large purple cones. The variety of this tree with green cones (var. *umbellata*) has grown more rapidly in the Arboretum than the purple-coned tree, but it is a tree of more open habit and with lighter green leaves, and is less valuable as an ornamental tree. *Abies cilicica* from Asia Minor and *A. cephalonica* from southeastern Europe have grown well in Massachusetts for many years; although they have now nearly recovered, these two trees suffered severely in the cold winter of 1917-18.

Thuja, the name of the Arbor Vitaes, is a small genus confined to eastern and western North America, Japan, Korea and north China.

All the species with many varieties are in the Arboretum, and all do well here with the exception of the north China *T. orientalis* which probably needs a drier climate, for it is the only conifer which really grows well on the plains of western Kansas. The Red Cedar of the northwest coast (*Thuya plicata* or *gigantea*) is one of the great trees of the world, and in the Arboretum has grown to be one of the handsomest conifers in the collection.

Chamaecyparis, which differs from Cupressus chiefly in the fruit which matures at the end of the first season, is the name of the White Cedar. The genus is confined to the coast regions of eastern and western North America, to Japan and Formosa. The two Japanese species often called Retinosporas, with many abnormal forms, are common in gardens and old inhabitants of the Arboretum. The eastern American species, *Chamaecyparis thyoides*, although a common inhabitant of Massachusetts swamps, has grown slowly in the Arboretum and has occasionally been partly killed in severe winters. The handsomest and the largest of the genus, and one of the noblest of North American trees, *Chamaecyparis Lawsoniana*, the Lawson Cypress as it is often called, can only drag out a miserable existence here, and the beautiful Alaska Cedar, *Chamaecyparis nootkatensis*, is not hardy here.

Tsuga, the name of the Hemlock, is another small genus with species in eastern and western North America, Japan, western China and the Himalayas. The western American species exist here, but will probably never become large trees. The mountain Hemlock of Japan (*T. diversifolia*) is hardy and healthy, but it grows slowly and is not as handsome as our native species. The handsome but less hardy *T. Sieboldii*, a more southern tree, lives in sheltered positions but does not seem suited for general planting in Massachusetts. The Chinese species (*Tsuga chinensis*) has lived for several years in the Arboretum, although it was a good deal injured in the winter of 1917-18. The handsomest of the Hemlocks which can be grown in Massachusetts and now one of the most beautiful trees in the Arboretum is a native of the southern Appalachian Mountains, *Tsuga caroliniana*.

Pseudotsuga. Of the three species of this genus only the Rocky Mountain form of *Pseudotsuga taxifolia* is hardy here. It has been growing in Massachusetts since 1863, and up to this time has proved one of the hardiest, handsomest and most rapid growing conifers which has been brought into this part of the country.

Juniperus. This is one of the largest and most widely distributed genera of conifers, for Junipers are found in all temperate and elevated parts of the Northern Hemisphere; they flourish in arid semi-desert regions in the interior of continents, and extend into the tropics. Some species are large and valuable trees and others are prostrate shrubs, the same species being sometimes a tree and sometimes a shrub. Massachusetts is too cold and wet for most Junipers, and only a small number of species with a number of varieties have been successfully grown in the Arboretum. The mild winter and the wet summer and autumn have helped this collection and the Arboretum Junipers have not before been in as good condition as they are now.

These Bulletins will now be discontinued until the spring of next year.

5, 1919 index

INDEX

Synonyms are in *italics*

Abies, 67
  brachyphylla, 23, 67
  cephalonica, 67
  cilicica, 67
  concolor, 67
  holophylla, 23
  homolepis, 23, 67
    var. umbellata, 67
Acanthopanax ricinifolium, 34, 46
  sessiliflorum, 47
Acer ginnala, 54
  griseum, 7
  mandshuricum, 54
  nikoense, 54
  rubrum, 53
  tataricum, 51
Aesculus arguta, 22
  Briotii, 22
  Bushii, 22
  californica, 21
  carnea, 22
  discolor var. mollis, 22
  georgiana, 22
  glabra, 22
  Hippocastanum, 21
  octandra, 22
  parviflora, 48
  Pavia, 22
  turbinata, 21, 34
  versicolor, 22
Alaska Cedar, 68
Amelanchier canadensis, 7
  laevis, 7
  oblongifolia, 7
Amelanchiers, 7
American Burning Bushes, 56
American Hawthorns, 56
American Magnolias, 22
American Smoke-tree, 64
American White Fir, 67
Amorpha canescens, 47
Andromeda floribunda, 56
Apricot, Black, 8
Aralia chinensis, 46
    var. glabrescens, 46
    var. mandshurica, 46
Aralia spinosa, 46
Arbor Vitaes, 67, 68
Aronia nigra, 55
Ash, Black, 42
  Blue, 42, 43
  Flowering, 41
  Green, 42
  Manna, 41
  Red, 42
  White, 42, 43
Ashes, Mountain, 41
Ash-trees, 41, 42
  Old World, 43
Asiatic Crabapples, 12, 13
Asiatic Quinces, 16
Autumn colors, 53
Azalea Kaempferi, 32
  Schlippenbachii, 11, 32
Azaleas, 20, 24
  two Korean, 11, 12

Balkan Spruce, 66
Bay, Sweet, 35
Bitter Sweet, 44
Black Apricot, 8
Black Ash, 42
Black Haw, 20
Blue Ash, 42, 43
Boursault Rose, 31
Box Elder, Chinese, 7
Buckeye, Ohio, 21
Buckeyes, Horsechestnuts and 21, 22
Buddleias, Chinese, 47
Burning Bush, 54
Burning Bushes, American, 56
Bush Honeysuckles, 20, 24, 50, 51

Callitris, 65
Calluna vulgaris, 47
Cedar, Alaska, 68
  Red, 68
  White, 68
Celastrus, 44
Cercidiphyllum japonicum, 7, 34
Chaenomeles japonica, 16, 56

Chaenomeles lagenaria, 16
  Maulei, 16
Chamaecyparis, 68
  Lawsoniana, 68
  nootkatensis, 68
  thyoides, 68
Cherry, Cornelian, 2
  Sargent, 5, 9
  Spring, 6
Cherries of eastern Asia, 4
Cherry-tree, Japanese Weeping, 6
Cherry-trees, new Chinese, 9
Chinese Box Elder, 7
  Buddleias, 47
  Cotoneasters, 18, 19, 56
  Golden Larch, 57
  Honeysuckle, 20, 39
  Lilacs, 26
  Magnolias, hybrid, 2
  Rose, 44
  Witch Hazel, 1
Chokeberry, 55
Chrysanthemum nipponicum, 63
  sibiricum, 63
Clethra alnifolia, 51
  barbinervis, 51
  Japanese, 51
Climbing Hydrangea, 32
Combination, a good, 39
Conifers, 65
Cornel, 36
  Silky, 40
Cornelian Cherry, 2
Cornus alba, 51
    var. Rosenthalii, 51
  amomum, 40
  circinata, 36
  florida, 33, 34, 61, 62
  kousa, 33, 34, 62
  Mas, 2
  Nuttallii, 33, 62
  paucinervis, 48
  racemosa, 39
  rugosa, 36
  stolonifera, 51
Cotinus americanus, 64
  coggygria, 64
Cotoneaster acutifolia, 19
    var. villosula, 19
Cotoneaster adpressa, 19
  ambigua, 19
  apiculata, 19, 56
  bullata, 19
    var. floribunda, 19
    var. macrophylla, 19
  Dielsiana, 19
    var. elegans, 19
  divaricata, 19
  foveolata, 19
  Franchetii, 19
  horizontalis, 19, 56
    var. perpusilla, 19, 56
    var. Wilsonii, 19, 56
  hupehensis, 19
  moupinensis, 19
  multiflora calocarpa, 19
  nitens, 19
  obscura, 19
  racemiflora, 19
    soongorica, 19
  Zabellii, 19
    var. miniata, 19
Cotoneasters, Chinese, 18, 19, 56
Crab, Parkman, 14
  Von Siebold's 15
Crabapple, Siberian, 13
Crabapples, Asiatic, 12, 13
Crataegus, 62
  aprica, 56
  arkansana, 56
  coccinioides, 56
  Dawsoniana, 56
  Douglasii, 56
  fecunda, 56
  hiemalis, 62
  nitida, 56
  orientalis, 63
  oxyacantha var. Gireoudii, 62
  pinnatifida, 62
  pruinosa, 56
  prunifolia, 56
  succulenta, 56
  in Autumn, 56
Cryptomeria, 57, 65
    var. elegans, 57
Cucumber Tree, 23
Cunninghamia, 65
Cupressus, 65

Cydonia Maulei, 56
Cypress, Lawson, 68
Cytisus capitatus, 47
  leucanthus, 47
  nigricans, 47

Deutzia discolor, 39
    major, 39
  globosa, 39
  gracilis, 38
  grandiflora, 39
  hypoglauca, 39
  Lemoinei, 38
  longifolia, 39
  parviflora, 38, 39
  Wilsonii, 39
Deutzias, 38
Diervilla florida venusta, 23
Dimorphanthus mandschuricus, 46
Dirca palustris, 1
Dogwood, Flowering, 33, 61, 62
Dwarf Quince, 56

Early Flowering Hydrangeas, 34
  Viburnums, 12
Elder, 39
European Horsechestnut, 34
Evergreens, broad-leaved, 56
Evonymus alatus, 54
  obovatus, 56

Fir-trees, 67
Fir, American White, 67
Flowering Ash, 41
  Dogwood, 33, 61, 62
Flowers, late, 63
Fokienia, 57
Forsythia intermedia, 3
    var. pallida, 3
    var. primulina, 3
    var. spectabilis, 3
  suspensa var. Fortunei, 3
Forsythias, 2, 3
Fragrant Sumach, 55
Fraxinus, 41
  americana, 42
    var. subcoriacea, 42
  anomala, 43
  biltmoriana, 43
Fraxinus Bungeana, 41
  chinensis
    var. rhyncophylla, 43
  cuspidata, 41
  dipetala, 41
  excelsior, 43
  Greggii, 41
  longicuspis, 41
  mandshurica, 43
  nigra, 42
  oregona, 43
  Ornus, 41
  pennsylvanica, 42
    var. lanceolata, 42
  platypoda, 44
  potamophylla, 43
  quadrangulata, 43
  rotundifolia, 43
  texensis, 43
Fruits in the Arboretum, 49

Genista tinctoria, 47
Glyptostrobus, 57
Green Ash, 42

Halesia carolina, 63, 64
    var. monticola, 64
Halimodendron argenteum, 36
Hamamelis mollis, 1
  vernalis, 1
Haw, Black, 20
Hawthorns, American, 56
  Old World, 62
Heathers, 47
Hemlock, 68
Hercules' Club, 46
Hobble Bush, 12
Holly, Mountain, 51
Honeysuckle, Chinese, 20, 39
  Swamp, 44
  Tartarian, 49, 50
Honeysuckles, Bush, 20, 24, 50, 51
  as fruit plants, 49
Horsechestnut, European, 34
  hybrid, 22
  Japanese, 34
Horsechestnuts and Buckeyes, 21, 22
Hydrangea arborescens
    var. grandiflora, 47
  Bretschneideri, 34, 35

Hydrangea cinerea, 47
  Climbing, 32
  paniculata, 47
    var. praecox, 47
  petiolaris, 32, 34, 52
  quercifolia, 47
  radiata, 47
  Rosthornii, 35
  xanthoneura, 35
    var. setchuensis, 35
    var. Wilsonii, 35
Hydrangeas, Early Flowering, 34

Indigofera, 51
  amblyantha, 35, 51
  atropurpurea, 52
  decora, 52
  Gerardiana, 52
  hebepetala, 52
  Kirilowii, 51
  Potaninii, 35, 51

Japanese Cherry-trees, 5, 6
    double-flowered, 5
  Flowering Dogwood, 62
  Horsechestnut, 34
  Lacquer-tree, 45
  Weeping Cherry-tree, 6
July Roses, 48
Juniperus, 68

"Kaido," 14
Kalmia latifolia, 32
Keaki, 60
Keteleeria, 65
Koelreuteria paniculata, 45
Kolkwitzia amabilis, 28

Lacquer-tree, Japanese, 45
Larch, Chinese Golden, 57
Larix, 66
  Griffithii, 66
  Lyallii, 66
  Potaninii, 66
Late flowers, 63
Laurels, 32
Lawson Cypress, 68
Lead Plant, 47
Leatherwood, 1
Leaves, unfolding, 7
Lespedezas, 47
Libocedrus, 65
Lilacs, 17
  Chinese, 26
  hybrid, 17
  Tree, 36
Lindens, 45
Lonicera amoena, 24, 50
  Arnoldiana, 24
  bella, 24, 50
  coerulea, 50
  Giraldii, 39
  involucrata, 51
    var. serotina, 51
  Korolkowii, 24, 50
  Ledebourii, 51
  minutiflora, 50
  Morrowii, 24, 50
  muendeniensis, 50
  muscaviensis, 50
  notha, 24, 50
  Ruprechtiana, 50
  syringantha, 20
  tatarica, 24, 49, 50
    var. lutea, 50
    var. rosea, 50
  trichosantha, 50

Magnolia acuminata, 23
  conspicua, 2
  cordata, 23
  denudata, 2
  Fraseri, 23
  glauca, 23, 35, 36
  kobus, 2
    var. borealis, 2
  macrophylla, 23
  major, 36
  pyramidata, 22
  Soulangeana, 2
  stellata, 2
  Thompsoniana, 36
  tripetala, 23, 36
    virginiana, 35
Magnolias, American, 22
  Chinese, hybrid, 2
Malus Arnoldiana, 15
  baccata, 13

Malus baccata var. Jackii, 13
    var. mandshurica, 12, 13
  cerasifera, 14
  floribunda, 14
  Halliana, 12, 14
    Parkmanii, 14
  micromalus, 12, 14
  prunifolia var. rinki, 16
  Sargentii, 15
  Scheideckeri, 16
  Sieboldii, 15
    var. arborescens, 15
    var. calocarpa, 15
  spectabilis, 15
  theifera, 14
Manna Ash, 41
Maple, Red, 53, 55
  Tartarian, 51
Mock Orange, 29
Moosewood, 12
Mountain Ashes, 41
  Halesia, or Silver Bell Tree, 63, 64
  Holly, 51
  Magnolia, 23

Nannyberry, 28
Neillia sinensis, 28
Nemopanthus mucronata, 51
New Chinese Cherry-trees, 9
  Pear-trees, 10, 11
North American Roses, 55
Norway Spruce, 66

Ohio Buckeye, 21
Oxydendron arboreum, 47

Pagoda-tree, 46
Parkman Crab, 14
Pear, Keiffer, 10
  Leconte, 10
  Sand, 10
Pear-trees, new Chinese, 10, 11
Phellodendron amurense, 53, 54
  sachalinense, 52, 54
Philadelphus, 29, 30, 31
  coronarius, 29, 30, 31
  Falconeri, 30
  grandiflorus, 30
  hirsutus, 30
  inodorus, 30
Philadelphus insignis, 30
  latifolius, 30
  Lemoinei, 31
    Avalanche, 31
    Boule d'Argent, 31
    Bouquet Blanc, 31
    Candelabre, 31
    Erectus, 31
    Fantasie, 31
    Gerbe de Neige, 31
    Mont Blanc, 31
  maximus, 31
  microphyllus, 30, 31
  pekinensis, 30
  pubescens, 30
  purpurascens, 30
  Schrenkii var. Jackii, 29
  Souvenir de Billard, 30
  splendens, 31
  tomentosus, 31
Photinia villosa, 64
Picea, 66
  Abies, 66
  Alcockiana, 67
  bicolor, 67
  Breweriana, 66
  Glehnii, 67
  jezoensis, 67
    var. hondoensis, 67
  morrisonicola, 66
  obovata, 66
  omorika, 66
  orientalis, 66
  polita, 67
  Sargentiana, 66
  sitchensis, 66
Pine, Umbrella, 57
  White, 66
Pinus, 65, 66
  Armandi, 66
  ayacahuite, 65
  Bungeana, 66
  excelsa, 66
  Massoniana, 66
  sinensis, 66
Plants for the edge of beds of large shrubs, 55
Populus Maximowiczii, 34
Potentilla fruticosa, 40

Potentilla Veitchii, 40
Prairie Rose, 48
Prinsepia sinensis, 8
  uniflora, 8
Privet, 36
Provence Roses, 44
Prunus avium, 10
  canescens, 9
  concinna, 4, 10
  dasycarpa, 8
  Davidiana, 2
  Dielsiana, 10
  incisa, 4
  persicoides, 3
  pilosiuscula, 10
  serrulata thibetica, 10
  serrulata pubescens, 9
  serrulata, 5
    var. sachalinensis, 5, 9
    spontanea, 9
  subhirtella, 5, 6
    var. ascendens, 6
    var. pendula, 6
  tomentosa, 4, 10
    var. endotricha, 4
  triloba, 4
    var. plena, 4
  yedoensis, 5, 6
Pseudolarix, 57, 58, 65
  amabilis, 57, 58, 59
Pseudotsuga, 68
  taxifolia, 68
Pyrus betulaefolia, 11
  Bretschneideri, 11
  Calleryana, 10
  japonica, 16
  Maulei, 56
  ovoidea, 11
  pashia, 11
  phaeocarpa, 11
  serotina, 10
  serrulata, 11
  ussuriensis, 3, 11

Quince, dwarf, 56
Quinces, Asiatic, 16

Rambler Roses, 48
Red Ash, 42
  Cedar, 68
Red Maple, 53, 55
  Spruce, 66
Red-fruited Viburnums, 40
Retinosporas, 68
Rhododendron arborescens, 39
  arboreum, 26
  arbutifolium, 56
  brachycarpum, 25
  calendulaceum, 32, 39
  canescens, 20, 24
  carolinianum, 25, 56
  catawbiense, 25, 26
    hybrids, 26
  caucasicum, 25
  dahuricum, 2, 20
    var. sempervirens, 2
  ferrugineum, 25
  hirsutum, 25
  japonicum, 24
  Kaempferi, 12, 16, 20, 24, 32
  maximum, 25, 26
  Metternichii, 26
  minus, 25, 26
  mucronulatum, 2, 20
  myrtifolium, 56
  nudiflorum, 20, 24
  ponticum, 26
  poukhanense, 11, 12, 23
  rhombicum, 12
  Schlippenbachii, 11, 23, 32
  Smirnowii, 25
  Vaseyi, 20, 24
  viscosum, 44
  Wilsonii, 56
Rhododendrons, 25, 26
  hybrid, 26, 56
Rhus *aromatica*, 8, 55
  canadensis, 8, 55
Rosa Arnoldiana, 38
  bella, 31
  caudata, 35
  chinensis, 31
  cinnamomea, 20
  Ecae, 20
  gallica var. officinalis, 44
  Helenae, 32, 35
  Hugonis, 20
  Jackii, 23, 48
  kamtschatica, 37
  Lheritieranea, 31

Rosa lucida, 39
  Marretii, 31
  multibracteata, 44
  multiflora, 32, 48
    cathayensis, 32, 35
    platyphylla, 32
  omeiensis, 20
  pendulina, 31
  provincialis, 44
  Roxburgii var. normalis, 31
  rugosa, 31, 37
    hybrids of, 38
    Arnold Rose, 38
    Conrad Ferdinand Meyer, 38
    General Jacqueminot, 38
    Lady Duncan, 38
    Madame George Bruant, 38
    Nova Zembla, 38
    repens alba, 38
  sertata, 27
  setigera, 48
  spinosissima, 28
    var. altaica, 28
    var. fulgens, 28
    var. grandiflora, 28
    var. hispida, 28
    var. lutea, 28
  stellata, 48
  virginiana, 39
  Wichuraiana, 38, 48
Rose, Boursault, 31
  Crimson Rambler, 32
  Prairie, 48
  Seven Sisters, 32
  Tea, 38
Roses, July, 48
  North American, 55
  Rambler, 48
  Scotch, 28
  some interesting, 31
Rubus laciniatus, 52
  thyrsoideus flore pleno, 52
  ulmifolius var. bellidiflorus, 52

Sambucus canadensis, 39
Sand Pear, 10
Sargent Cherry, 5, 9
Sassafras in autumn, The, 62
Schizophragma hydrangeoides, 52
Sciadopitys, 57, 65
Scotch Roses, 28
Sequoia, 65
Shad Bushes, 7
Shrubs, two useful, 8
    Summer-flowering, 27
Siberian Crabapple, 13
  Spruce, 66
Silky Cornel, 40
Silver Bell Tree, or
    Mountain Halesia, 63, 64
Smoke-tree, American, 64
  Old World, 64
Snowberries, 56
Sophora japonica, 46
    var. pendula, 46
    var. pyramidalis, 46
Sorbus, 41
Sorrel-tree, 47
Sour Wood, 47
Spiraea Henryi, 28
  Miyabei, 28
  Veitchii, 28
Spring Cherry, 6
Spruce, Balkan, 66
  Norway, 66
  Siberian, 66
  Tiger-tail, 67
Sumach, Fragrant, 55
Summer-flowering shrubs, 47
  trees, 45
Swamp Honeysuckle, 44
Sweet Bay, 35
Symphoricarpus, 56
  vulgaris, 56
Syringa, 29
  affinis, 16, 18
    var. Giraldii, 18
    Berryer, 18
    Claude Bernard, 18
    Lamartine, 18
    Mirabeau, 18
    Pascale, 18
    Vauban, 18
  amurensis, 36
Syringa chinensis, 18
  Henryi, 18
    var. Lutêce, 18
  hyacinthiflora, 18

Syringa japonica, 36, 52
  Josikaea, 18
  Julianae, 18
  Koehneana, 27
  Komarowii, 18
  microphylla, 27
  oblata, 16, 18
  pekinensis, 36
  persica, 18
  pubescens, 18, 27
  reflexa, 27
  rothomagensis, 18
  Sargentiana, 27
  Sweginzowii, 18, 27
  tomentella, 18, 27
  villosa, 18, 27
  vulgaris, 17, 18, 26
  Wilsonii, 27
  yunnanensis, 27
Syringas, hybrid, 17, 18

Taiwania, 57
Tartarian Honeysuckle, 49, 50
  Maple, 51
Taxodium, 65
Taxus canadensis, 1
Tea Rose, 38
Thuja, 67, 68
  gigantea, 68
  orientalis, 68
  plicata, 68
Thujopsis, 57
    var. Hondai, 57
Tiger-tail Spruce, 67
Tilia cordata, 51
    var. cordifolia, 51
Traveller's Tree, 20
Tree Lilacs, 36
Trees, summer-flowering, 45
Trees and shrubs,
    some July flowering, 51
Tripterygium Regelii, 44
Tsuga, 68
Tsuga caroliniana, 68
  chinensis, 68
  diversifolia, 68
  Sieboldii, 68
Two Korean Azaleas, 11, 12

Umbrella Pine, 57
  Tree, 23

Viburnum alnifolium, 12
  Carlesii, 12, 23
  cassinoides, 35
  dilatatum, 40, 60
  lantana, 20
  Lentago, 28
  prunifolium, 20, 60
  theiferum, 40
  Wrightii, 40
Viburnums, 20, 60
  early-flowering, 12
  red-fruited, 40
Von Siebold's Crab, 15

White Ash, 42, 43
  Cedar, 68
  Fir, American, 67
  Pine, 66
Witch Hazel, Chinese, 1
Witch Hazels, winter-flowering, 1
Woad Wax, 47

Xanthorrhiza, 55
  apiifolia, 8

Yellow Root, 8
Yew, 1

Zelkova serrata, 34, 60